STATEMENT OF WORK

TRIPLE/DOUBLE ENERGY WATER HEATERS

WITH SOLAR PANELS

JUNE 2012

US DEPARTMENT OF STATE - ATHENS

BY NP

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1. SITE ADDRESS

Government Owned Residences

2. SCOPE OF WORK

This document is being issued by the US Department of State with the purpose to enter into a contract the purchase and installation of four (4) sets of triple energy water heaters with solar panels at the residences: **Monroe, Knox, Van Buren** and **Lansing**. In details the works to be carried in Monroe and Knox residences are:

- to install one (1) solar panel set of 7.2 m^2 (3x2.4 m^2) on roof top.
- to install two (2) triple energy water heaters of 300lt each (2x300lt).
- to install an automation for the best operation (including all pipes/electro valves/pumps/insulations/expansion tank, one way valves, manometers, pressure regulators, manual isolation valves, relief valves, sensors, differential thermostat, hydraulic kit for flow adjustment etc).
- to install anticorrosion protection (stopcor).
- to insulate all heating pipes inside the boiler room.

For Van Buren and Lansing:

- to install one (1) solar panel set of 4.8 m^2 (2x2.4 m^2) on roof top.
- to install two (2) triple energy water heaters of 200lt each (2x200lt).
- to install an automation for the best operation (including all pipes/electro valves/pumps/insulations/expansion tank, one way valves, manometers, pressure regulators, manual isolation valves, relief valves, sensors, differential thermostat, hydraulic kit for flow adjustment etc).
- to install anticorrosion protection (stopcor).
- to insulate all heating pipes inside the boiler room.

The contractor shall be responsible for the supply of all machinery, labour and materials necessary for the completion of the works.

The bidders shall also provide the cumulative duration of all work involved, which shall not be more than twenty (20) calendar days.

3. GENERAL CONDITIONS

3.1 MATERIALS, TOOLS AND CODES

3.1.1. All work must be executed strictly in accordance with the current Codes of Practice.

3.1.2. All works to be completed in accordance with the relevant and current Greek Standards.

3.1.3. The contractor is responsible for all the contractor-owned tools and equipment at all times and shall provide a lockable tool and material box for their operatives if required.

4. PARTICULAR CONDITIONS

4.1 MATERIALS SPECIFICATION

The contractor shall use high quality construction materials approved by the COR.

Solar panels: Sonne copper 2.4m^2 (1.2m x 2.0m) each panel

Triple energy water heaters: Sonne 200lt and 300lt Copper Electroboiler (50years warranty)

Circulators: Wilo ST 15/6 only.

Expansion tanks: Reflex only.

Piping: Hard copper pipes. Exclusions: Monroe(C) – soft copper pipe will run vertically as agreed with the COR.

Pipe sizes from water heaters to solar panels and back:

Residence	Pipe size (mm)	Insulation thickness (mm)
Monroe (C)	18	19
Knox (D)	18	19
Van Buren (H)	18	19
Lansing (I)	18	19

Valves/Electro valves: Cimberio only.

Thermal insulation **inside the boiler room**:

For pipes > 1" use 19mm Armaflex covered insulation

For pipes ≤ 1" use 13mm Armaflex covered insulation

All supports shall be by using Armafix insulated supports.

STOPCOR : Sizing should be determined according to the following table

StopCor Type	Burner Calories
A1	0-60000
A3	60000-150000
A5	200000-350000
A7	400000-600000

All materials to be used shall be indicated at the quote and approved by the COR. Quotes that do not specify in detail all materials that shall be used will be considered deficient.

4.2 SOLAR PANEL INSTALLATION

All systems shall be installed on the roof by the use of support types as agreed with the COR.

All systems shall be installed with recirculation assistance since the water heater will be installed at a lower level from the solar panels.

4.3 Water Heater Installation

Each triple energy water heater shall be installed inside the boiler room of each residence.

All triple energy water heaters shall be vertical.

One residence has recirculation system.

4.4 Piping

All pipe routes shall be appointed by the COR and shall be free to inspect.

4.5 Automation

All automation systems shall have adequate sensors so that it will work by the following way:

It will have a “list” of most preferable energy sources. First on that list will be the solar panels. If the sensors on the panels read that there is hot water on them, it sets all the valves in such a way that only solar hot water is being used. Now, if there is no hot water on the panels, it checks the second on the list, which is the water from the furnace to the radiators (heating system). If the occupant has turned on the heating and there is no solar hot water, the valves will get set in such a way that it will use the hot water that is going to the radiators. In the case that there is no hot water on either solar panels or the heating system it will turn on the electric heating of the water heater. By that way the boiler will always have hot water made by the best and most economical way available.

4.6 Thermal Insulation

All pipes/fixtures shall be insulated with the specified insulation thickness. The pipe supports shall have polyethylene insulation rings (Armafix). There shall be no part besides the water heater, the pump and the solar panels that shall not be insulated.

4.7 Power and Water Supply

All power supplies shall be provided by the Embassy personnel.

All water supplies shall be provided by the contractor as agreed with the COR on the site visit.

4.8 Work Delivery

Every solar water system shall be pressed, tested and delivered in full operation. Any damage made by the contractor to existing walls, fixtures, appliances etc shall be repaired/replaced as it was before the delivery of all works.